Space Weather Forecast

Issued on Friday, 29 December 2023 at 13:22 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of R1/Minor Radio Blackouts.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low with C-class flares observed, the largest of which was a C9.8 from AR3533 at 29/0754 UTC. There are six sunspot regions on the visible disc, most residing in the western hemisphere. The largest region is in the process of rotating around the southwestern limb. The aforementioned region is currently the most active region, though appears rather simple with an open structure. All the other regions appear stable. No Earth-directed coronal mass ejections have been observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar wind parameters indicate the possibility of two weak coronal mass ejection arrivals, one around 29/0000 UTC and the other around 29/1200 UTC. Speeds initially increased to near Elevated levels ahead of the first CME arrival, then gradually declined to background. Total magnetic field strength, IMF, was largely weak but became briefly moderate on the arrival of each CME. The north-south component, Bz, has varied weakly throughout, with a greater proportion within the positive sector. Geomagnetic activity was Quiet through the period.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low activity is likely to continue, with a chance of Moderate activity.

Solar Wind / Geomagnetic Activity: A coronal mass ejection is currently affecting the Earth, with only minor effects thus far, this was the last in a series of potential arrivals in the past 48 hours. Solar wind parameters should all decline back to background later on day 1 or by day 2 (29/30 Dec). Otherwise, a high speed stream is forecast to connect with Earth either late on day 3 (31 Dec) or on day 4 (01 Jan), giving speeds of 450-550 km/s.

Geomagnetic activity will start Quiet to Unsettled with a chance of Active intervals and a slight chance of G1/Minor Storm intervals. Activity is then expected to decline to become predominantly Quiet through 30 Dec, but then a risk of further Active to G1/Minor Storm intervals late on 31 Dec or on 01 Jan due to the connection with the high speed stream.

Energetic Particles / Solar Radiation: No solar radiation storms are expected.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	1	10	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	30	30
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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